



Report No.: AGC01199131101EE01
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EMC Test Report

Report No.: AGC01199131101EE01

TEST NAME : 1999/5/EC R&TTE Directive Art.3.1(b)
PRODUCT DESIGNATION : DCS Band Selective Repeater
BRAND NAME : Amplitec
MODEL NAME : W20-DCS,W20-LTE1800,W10-DCS,W10-LTE1800,
W15-DCS,W15-LTE1800
CLIENT : Foshan Amplitec Tech Development Co., Ltd.
DATE OF ISSUE : Nov.19, 2013
STANDARD(S) : ETSI EN 301 489-1 V1.9.2:2011
ETSI EN 301 489-8 V1.2.1: 2002
REPORT VERSION : V 1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 19,2013	Valid	Original Report

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1. GENERAL INFORMATION

Applicant:	Foshan Amplitec Tech Development Co., Ltd. 6th-7th floor, Second building, No.4 Guda Road of ZhangCha Guzao, ChanCheng District, FoShan City, GuangDong Province, China
Manufacturer:	Foshan Amplitec Tech Development Co., Ltd. 6th-7th floor, Second building, No.4 Guda Road of ZhangCha Guzao, ChanCheng District, FoShan City, GuangDong Province, China
Product Designation :	DCS Band Selective Repeater
Brand Name:	Amplitec
Model Name:	W20-DCS
Serials Model:	W20-LTE1800,W10-DCS,W10-LTE1800,W15-DCS,W15-LTE1800
Difference description:	All the same except for the brand name and model name.
Date of Test:	Nov. 09,2013~ Nov. 18, 2013

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
ETSI EN 301 489-1 V1.9.2:2011 ETSI EN 301 489-8 V1.2.1: 2002	compliance

The above equipment was tested by Attestation Of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in ETSI EN 301 489-1 ,ETSI EN 301 489-8 and ETSI EN301 489-23. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:

Bart Xie

Nov. 19, 2013

Reviewed By:

Kidd Yang

Nov. 19, 2013

Approved By:

Solger Zhang

Nov. 19, 2013

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2. EUT DESCRIPTION

- Repeater

	Uplink	Downlink
DCS 1800	1760.3 MHz ~ 1772.3 MHz	1855.3 MHz ~ 1867.3 MHz
Hard Ware Version	W15-V03	
Soft Ware Version	N/A	
AC Input Voltage	INPUT 100-240V, 50/60Hz, 2A	
DC Output Voltage	DC 12, 5A	
Output Power (UL)	UL: 15±2 dBm DL: 20±2 dBm	
VSWR	≤2	
Gain	UL: 65±2 dB DL: 70±2 dB	
Ripple	3 dB	
Max. Input Power Without Damage	-10 dBm	
Impedence	50 ohm	

Note: For more details, please refer the user's manual

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3. TEST METHODOLOGY

All tests were performed in accordance with the procedure documented in ETSI EN 301 489-1 V1.9.2 (2011-09) as referenced in ETSI EN 301 489-8 V1.2.1 (2002-08)

3.1. ANTENNA

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 meters from the leading edge of the turntable.

3.2. DECISION OF TEST MODE

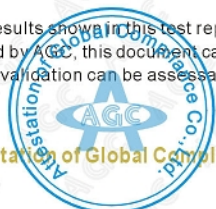
Mode 1: operation mode

1. DCS 1800

Mode 2: Standby Mode

Note: both DCS 1800 in operation mode have been tested, and the DCS 1800 mode is the worst condition as result in the test report.

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4. INSTRUMENT AND CALIBRATION

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

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5. FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

Test Site:	Attestation of Global Compliance (Shenzhen) Co.,Ltd.
Address:	1F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen

5.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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6. SETUP OF EQUIPMENT UNDER TEST

6.1. SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	RF COMMUNICATION TEST SET	HP	8920B	--	--	--

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

6.3. TEST SETUP

The equipment under test was configured and operated in a manner of normal operation. EUT tended to maximize its emission characteristics in a typical application for conducted and radiated emission measurement. The RF module plus ancillary (stand alone unit) was evaluated as per table 2 of clause 7.1 of ETSI EN 301 489-1.

Software Used During the Test	
Operating System	--
File Name	--
Program Sequence	--
RF Management Software	--

Remark: During the test, no modification is made to the EUT to comply with Class B limit levels.

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7. ETSI EN 301 489-1/-8 REQUIREMENTS

7.1. RADIATED EMISSION

LIMIT

Please refer to ETSI EN 301 489-1 Clause 8.2.3, Table 3 and EN 55022 Clause 6, Table 6, Class B

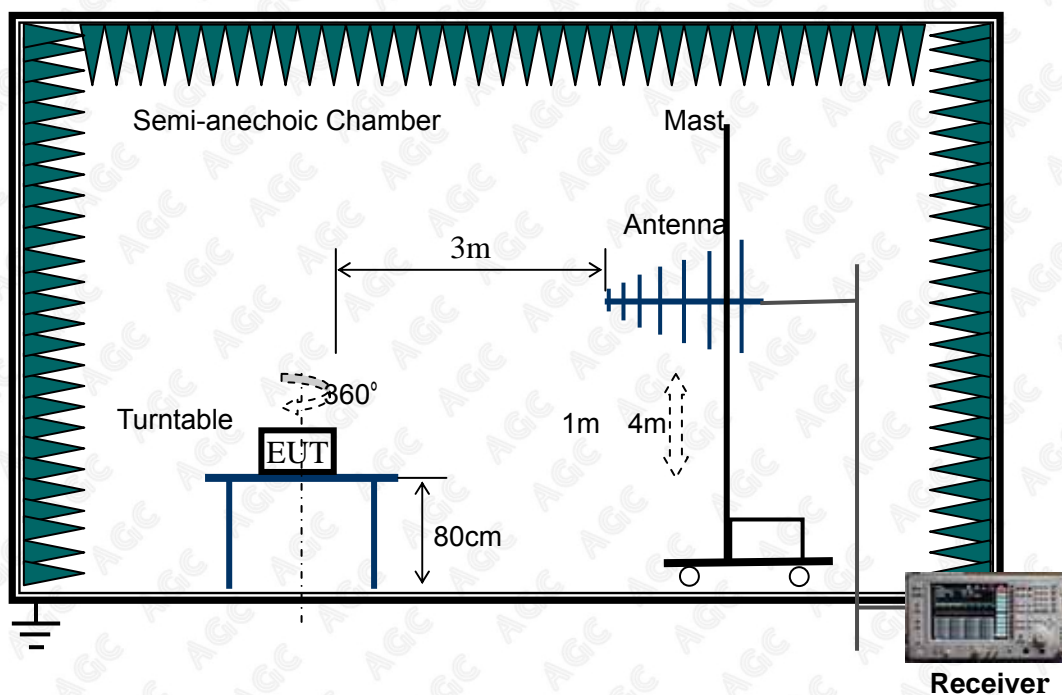
MEASUREMENT EQUIPMENT USED

Radiated Emission Test Site # 4				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER	R&S	ESCS30	100307	2014-07-16
AMPLIFIER	HP	HP8447D	2944A10419	2014-07-16
ANTENNA	R&S	VULB9163	9163-194	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

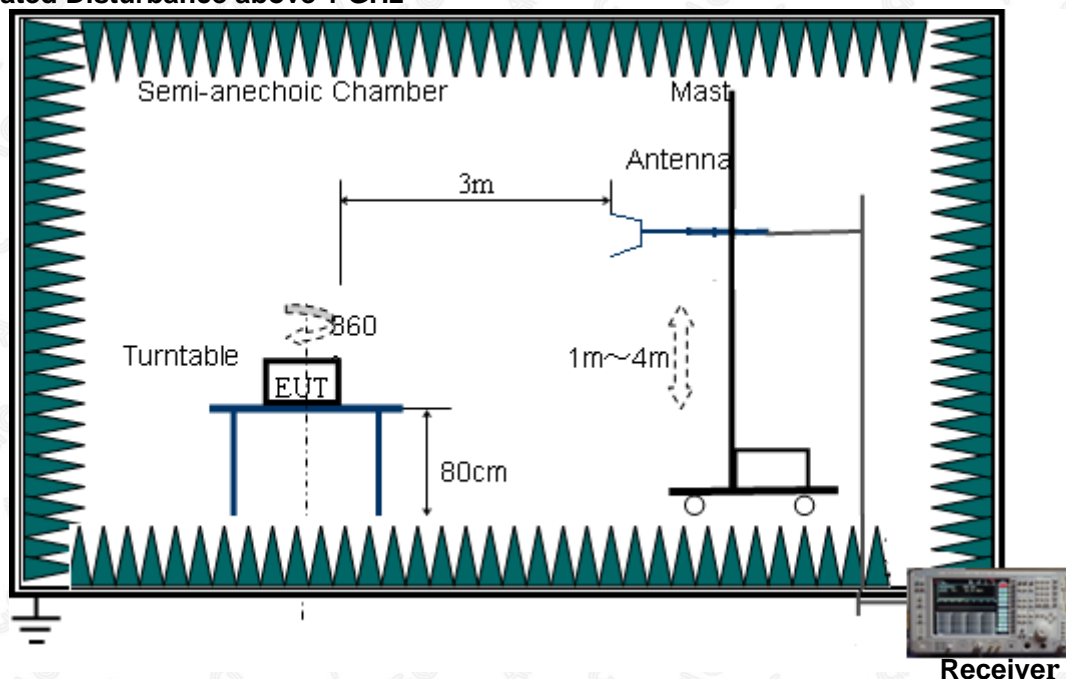
TEST CONFIGURATION

Radiated Disturbance 30M to 1 GHz



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Radiated Disturbance above 1 GHz



For the actual test configuration, please refer to the related item-Photographs of the Test Configuration.

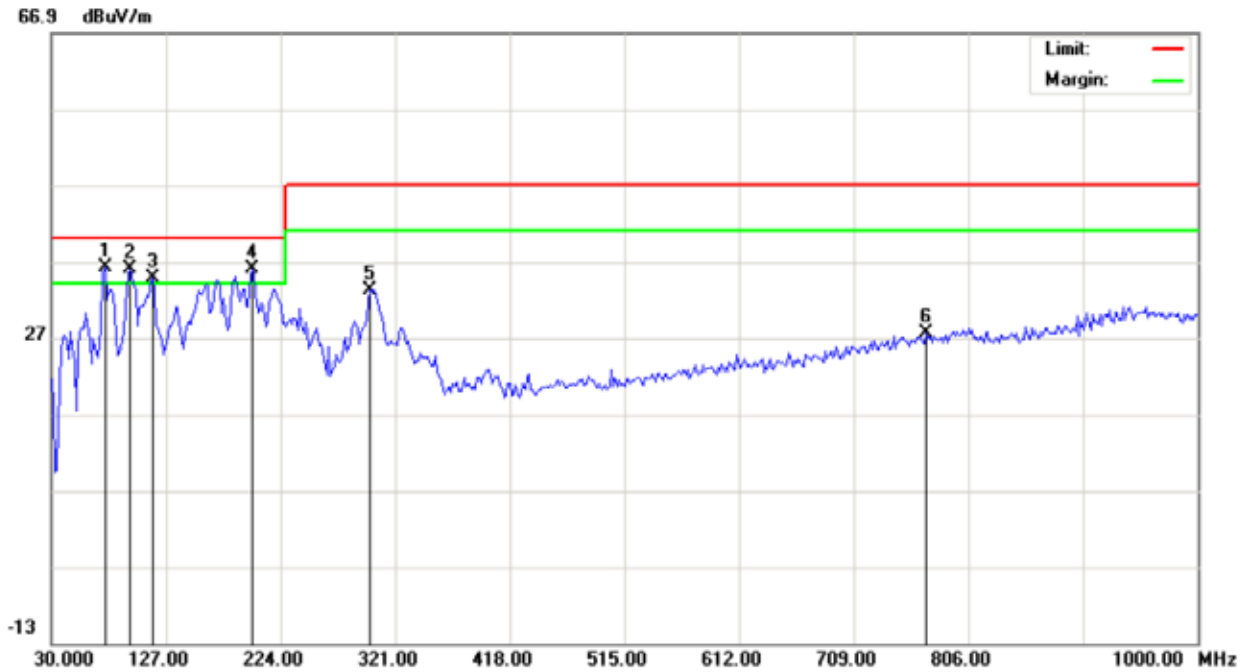
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TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.2.2 and EN 55022 Clause 6 for the measurement methods.

TEST RESULTS



Site: site #1

Limit: EN55022 ClassB 3M Radiation

EUT: DCS Band Selective Repeater

M/N: W20-DCS

Mode: DCS 1800

Note:

Polarization: **Horizontal**

Power: AC 230V/50Hz

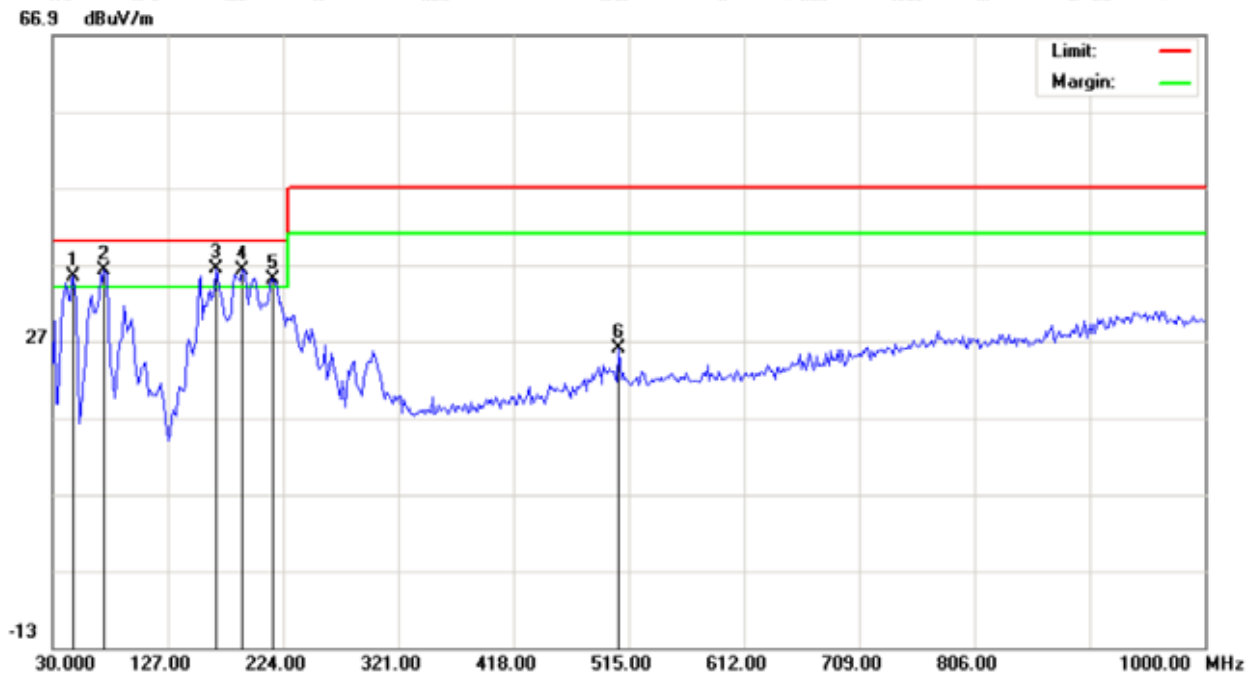
Distance:

Temperature: 26

Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	75.2667	26.24	10.02	36.26	40.00	-3.74	peak			
2	!	96.2833	25.94	10.07	36.01	40.00	-3.99	peak			
3	!	115.6833	23.34	11.56	34.90	40.00	-5.10	peak			
4	!	199.7500	23.94	11.99	35.93	40.00	-4.07	peak			
5		299.9833	17.87	15.41	33.28	47.00	-13.72	peak			
6		770.4333	0.77	26.91	27.68	47.00	-19.32	peak			

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Site: site #1
Limit: EN55022 ClassB 3M Radiation
EUT: DCS Band Selective Repeater
M/N: W20-DCS
Mode: DCS 1800
Note:

Polarization: Vertical
Power: AC 230V/50Hz
Distance:

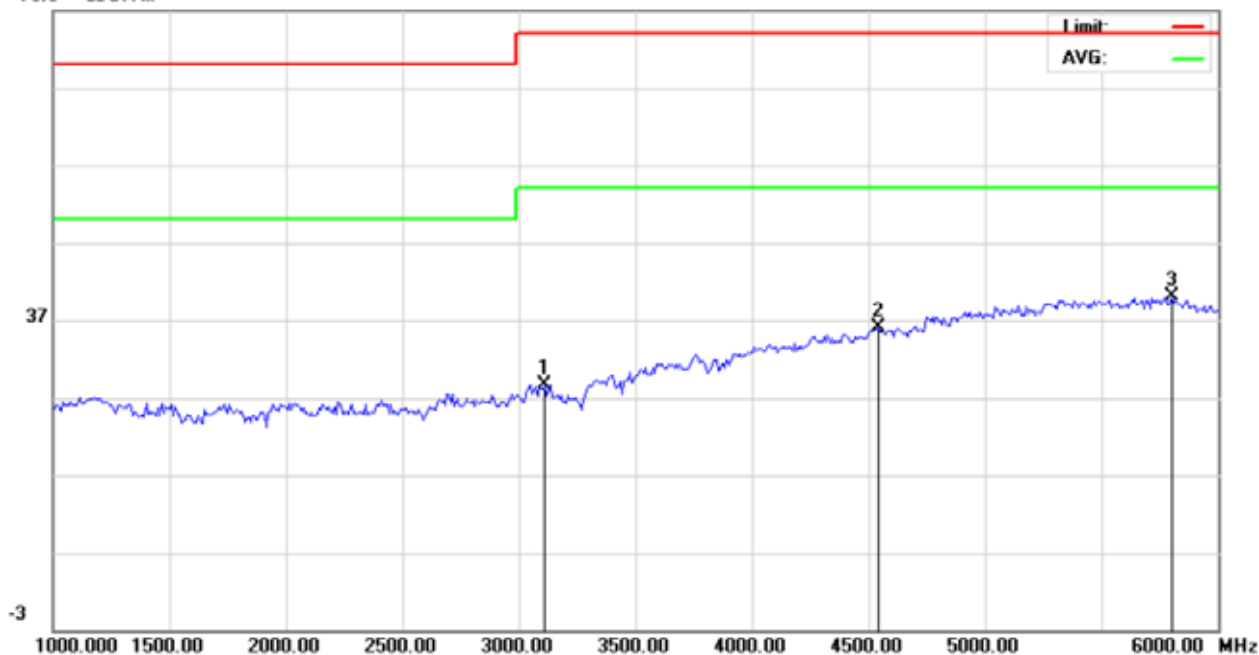
Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	47.7832	26.98	8.39	35.37	40.00	-4.63	peak			
2	!	73.6500	32.90	3.36	36.26	40.00	-3.74	peak			
3	*	167.4167	21.61	14.86	36.47	40.00	-3.53	peak			
4	!	190.0500	24.69	11.52	36.21	40.00	-3.79	peak			
5	!	215.9167	24.37	10.56	34.93	40.00	-5.07	peak			
6		506.9167	4.66	21.32	25.98	47.00	-21.02	peak			

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76.9 dBuV/m



Site: site #1
Limit: EN55022 Class B Above 1G(Peak)
EUT: DCS Band Selective Repeater
M/N: W20-DCS
Mode: DCS 1800
Note:

Polarization: **Horizontal**
Power: AC 230V/50Hz
Distance: 3m

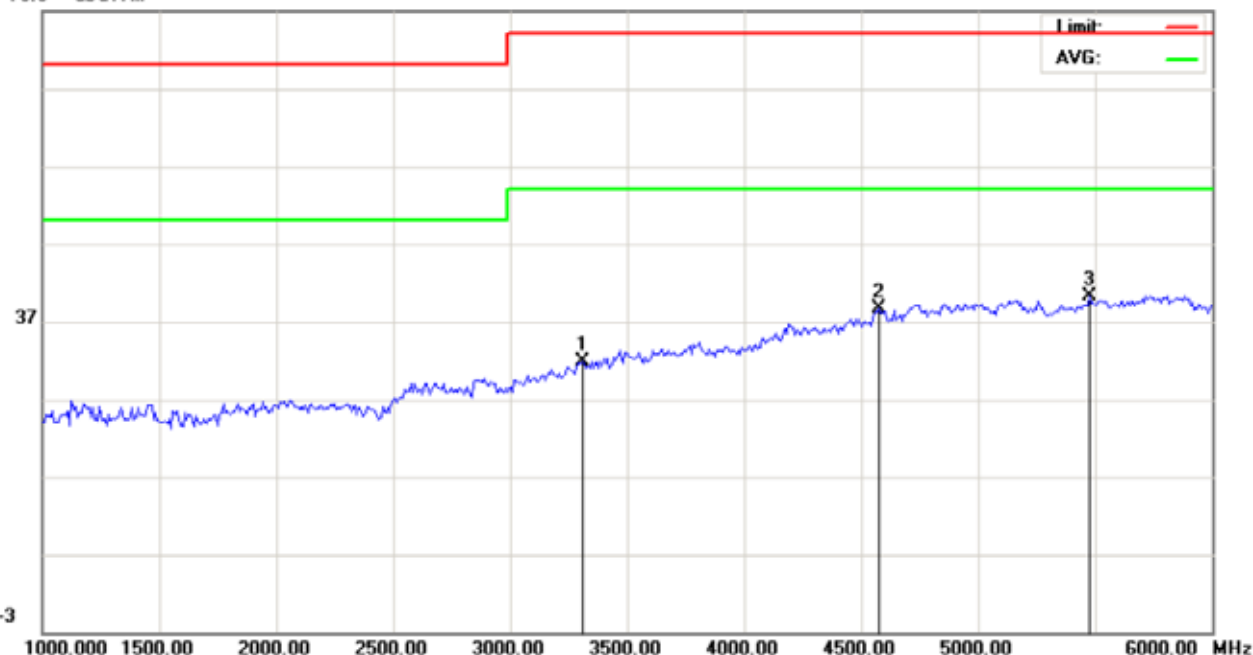
Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		3108.333	36.92	-8.26	28.66	74.00	-45.34	peak			
2		4541.667	38.92	-3.00	35.92	74.00	-38.08	peak			
3	*	5800.000	41.77	-1.67	40.10	74.00	-33.90	peak			

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76.9 dBuV/m



Site: site #1

Limit: EN55022 Class B Above 1G(Peak)

EUT: DCS Band Selective Repeater

M/N: W20-DCS

Mode: DCS 1800

Note:

Polarization: Vertical

Power: AC 230V/50Hz

Distance: 3m

Temperature: 26

Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		3308.333	39.89	-8.07	31.82	74.00	-42.18	peak			
2		4575.000	41.58	-2.91	38.67	74.00	-35.33	peak			
3	*	5475.000	42.08	-1.81	40.27	74.00	-33.73	peak			

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7.2. AC MAINS LINE CONDUCTED EMISSION

LIMIT

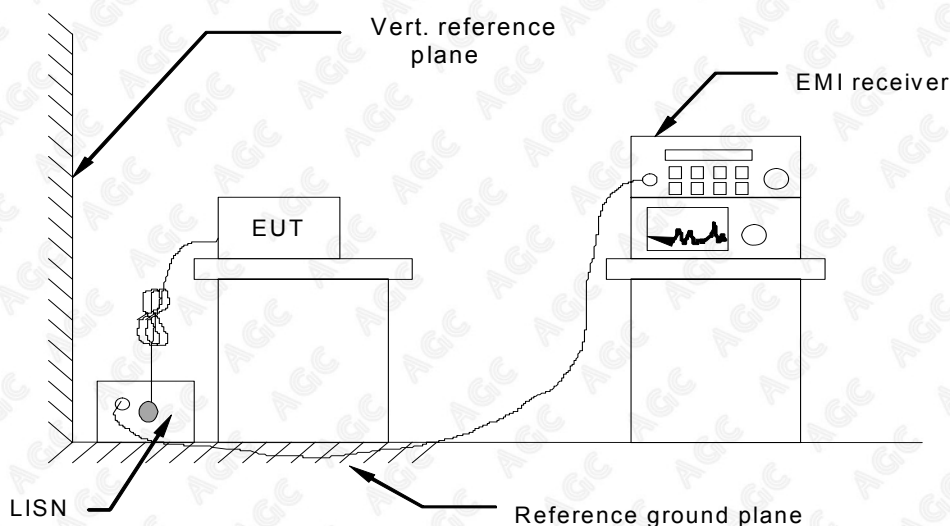
Please refer to ETSI EN 301 489-1 Clause 8.4.3, Table 8 and EN 55022 Clause 5, Table 2, Class B

MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site # 3				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	1166.5950.03	2014-07-16
LISN	R&S	ESH3-Z5	831.5518.52	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 8.4.2 and EN 55022 Clause 5 for the measurement methods.

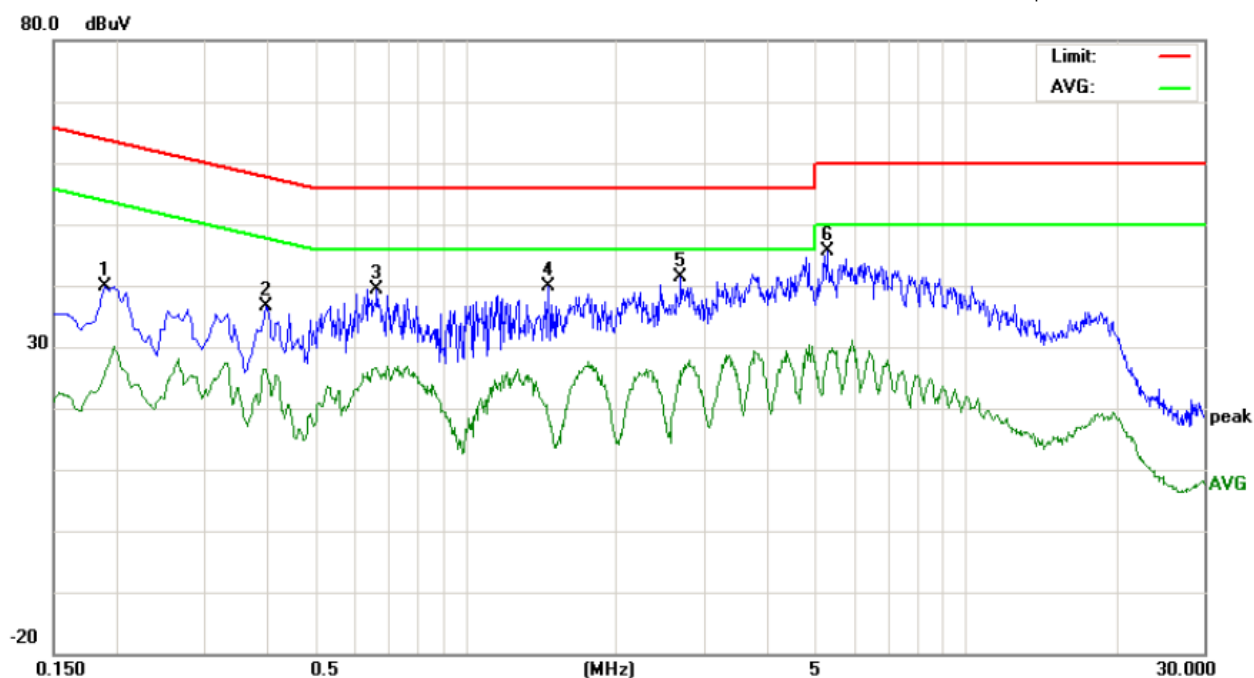
TEST RESULTS (OPERATION MODE)

Test performed on all modes, the mode 1 is the worst and recording in the following.

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CONDUCTED EMISSION TEST – LINE 1



Site: Conduction

Phase: **L1**

Temperature: 26

Limit: EN55022 Class B Conduction(QP)

Power:

Humidity: 60 %

EUT: DCS Band Selective Repeater

M/N: W20-DCS

Mode: DCS 1800

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1900	29.68		15.53	10.20	39.88		25.73	64.03	54.03	-24.15	-28.30	P	
2	0.3980	26.37		16.08	10.33	36.70		26.41	57.89	47.89	-21.19	-21.48	P	
3	0.6660	29.16		16.23	10.34	39.50		26.57	56.00	46.00	-16.50	-19.43	P	
4	1.4700	29.41		8.17	10.38	39.79		18.55	56.00	46.00	-16.21	-27.45	P	
5	2.6980	30.98		15.58	10.48	41.46		26.06	56.00	46.00	-14.54	-19.94	P	
6	5.3020	35.39		18.06	10.25	45.64		28.31	60.00	50.00	-14.36	-21.69	P	

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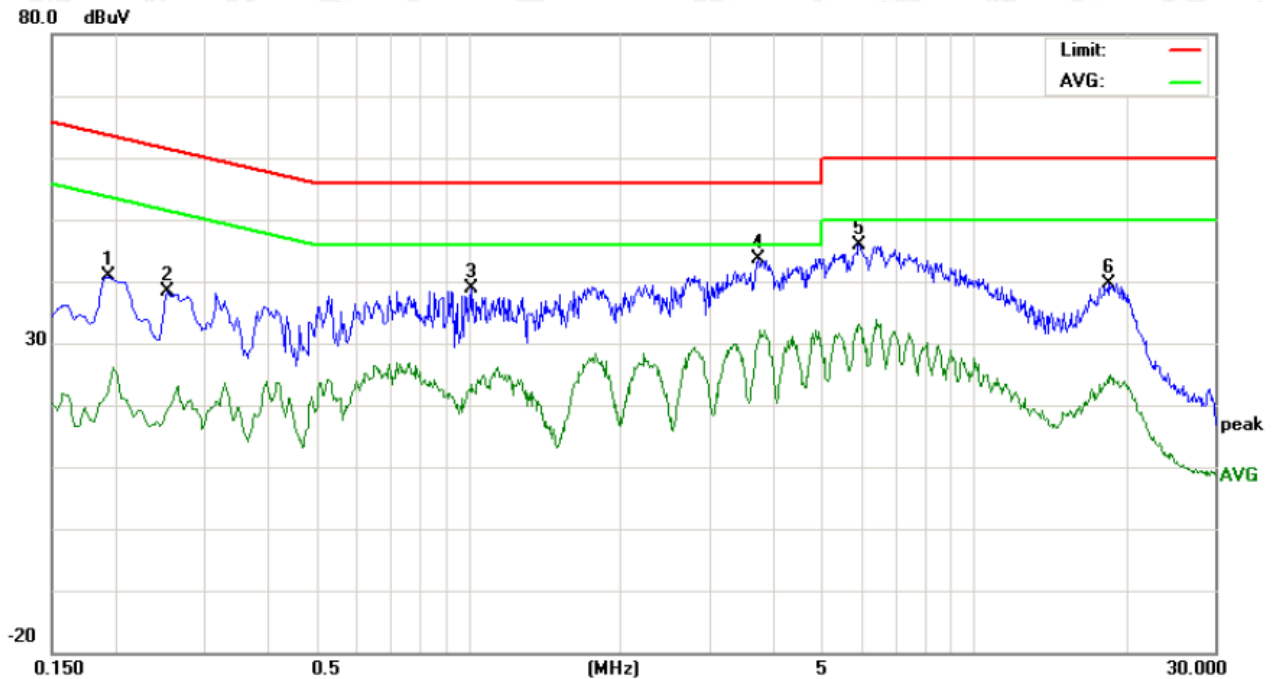
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Fax: (86-755) 26008484
E-mail: agc@ago-cert.com

Note: send your email to the mailbox(agccert@gmail.com) at the same time.



CONDUCTED EMISSION TEST – LINE 2



Site: Conduction Phase: **N** Temperature: 26
Limit: EN55022 Class B Conduction(QP) Power: Humidity: 60 %
EUT: DCS Band Selective Repeater
M/N: W20-DCS
Mode: DCS 1800
Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1940	30.60		11.88	10.21	40.81		22.09	63.86	53.86	-23.05	-31.77	P	
2	0.2540	28.01		9.19	10.27	38.28		19.46	61.62	51.62	-23.34	-32.16	P	
3	1.0180	28.61		12.93	10.37	38.98		23.30	56.00	46.00	-17.02	-22.70	P	
4	3.7580	33.11		20.16	10.47	43.58		30.63	56.00	46.00	-12.42	-15.37	P	
5	5.9340	35.64		22.75	10.28	45.92		33.03	60.00	50.00	-14.08	-16.97	P	
6	18.6060	29.51		13.58	10.12	39.63		23.70	60.00	50.00	-20.37	-26.30	P	

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7.3. AC MAINS HARMONIC CURRENT EMISSION

7.3.1 LIMITS OF HARMONIC CURRENT

Limits for Class A Equipment	
Harmonics Order n	Max. permissible harmonic current (A)
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \times 8/n$

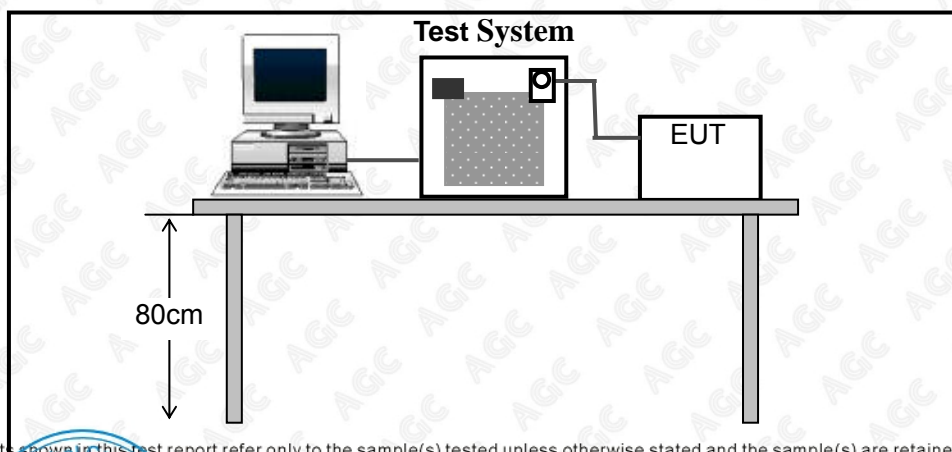
NOTE:

1. According to section 5 of EN61000-3-2, the EUT is Class A equipment.
2. The above limits are for all applications having an active input power > 75W. No limits apply for equipment with an active input power up to and including 75W.

7.3.2 TEST PROCEDURE

1. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
1. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

7.3.3 TEST SETUP



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For the actual test configuration, please refer to Appendix II : Photographs of the Test Configuration.

7.3.4 TEST RESULT

Test Specification

Test Frequency:	50Hz	Test Voltage:	230Vac
Waveform:	Sine	Test Time:	2.5min
Classification:	Class A		

Test Result

Harmonics Order	Harmonics Current (A)	Limit (A)	Harmonics Order	Harmonics Current (A)	Limit (A)
1	0.024	--	2	0.001	--
3	0.018	--	4	0.000	--
5	0.017	--	6	0.000	--
7	0.014	--	8	0.000	--
9	0.011	--	10	0.000	--
11	0.010	--	12	0.000	--
13	0.007	--	14	0.000	--
15	0.006	--	16	0.000	--
17	0.006	--	18	0.000	--
19	0.005	--	20	0.000	--
21	0.004	--	22	0.000	--
23	0.004	--	24	0.000	--
25	0.003	--	26	0.000	--
27	0.002	--	28	0.000	--
29	0.002	--	30	0.000	--
31	0.002	--	32	0.000	--
33	0.001	--	34	0.000	--
35	0.001	--	36	0.000	--
37	0.000	--	38	0.000	--
39	0.000	--	40	0.000	--

NOTE:

1. The active input power of the EUT is less **75 W**.
2. No limits apply for equipment with an active input power up to and including 75W.

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AC MAINS VOLTAGE FLUCTUATION AND FLICKER

LIMIT

Please refer to EN 61000-3-3

MEASUREMENT EQUIPMENT USED

AC MAINS FLICKER (EN 61000-3-3)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Harmonic Emission Flicker	California Instruments	500LIX-400-CTX	--	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION

(Same as the configuration of the AC MAINS HARMONIC CURRENT EMISSIONS TEST)

Ambient Condition of the Test Site			
Temperature	24	EUT AC Voltage Rating	AC 230 V/50 Hz
Humidity	50%	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Mary		

TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

TEST RESULTS (OPERATION MODE(DCS 1800))

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Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: DCS Band Selective Repeater
Test category: All parameters (European limits)
Test date: 2013-11-15 Start time: 16:43:03
Test duration (min): 10 Data file name: unnamed
Comment:

Tested by: Bart
Test Margin: 100
End time: 16:53:16

Test Result: Pass

Status: Test Completed

Pst and limit line

European Limits



Time is too short for Plt plot

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.89		
Highest dt (%):	-0.15	Test limit (%):	3.30 Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.09	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.006	Test limit:	1.000Pass
Highest Plt (2 hr. period):	0.000	Test limit:	0.650Pass

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Attestation of Global Compliance

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Note: send your email to the mailbox(agccert@gmail.com) at the same time.

7.4. ELECTROSTATIC DISCHARGE

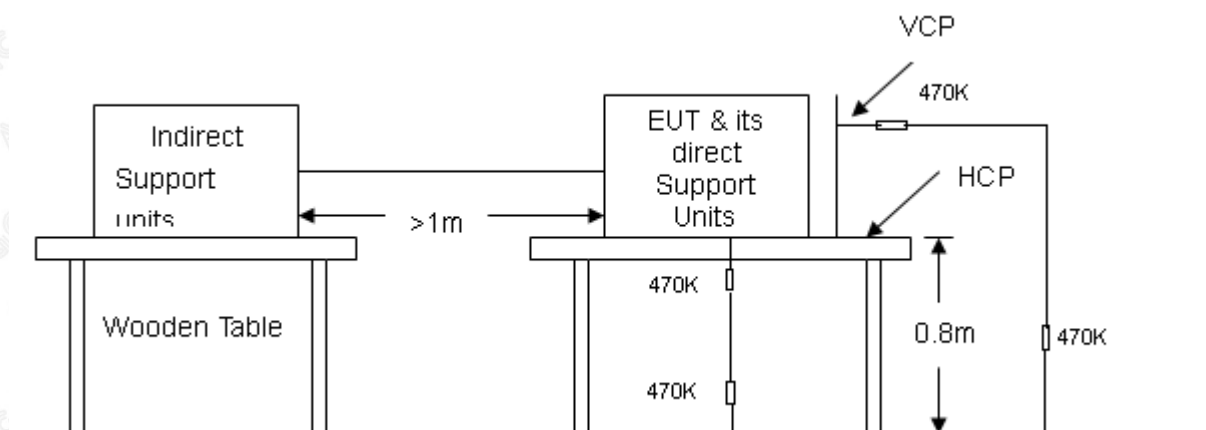
LIMIT

Please refer to EN 61000-4-2

MEASUREMENT EQUIPMENT USED

ESD test (61000-4-2)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
ELECTROSTATIC IMMUNITY TESTER	LIONCEL	ESD-203A	ESD02301005	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16
Spectrum Analyzer	R&S	FSU	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.



Test Configuration

Ambient Condition of the Test Site			
Temperature	22°C	EUT AC Voltage Rating	AC 230V
Humidity	50%RH	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Mary		

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TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.3.2 and EN 61000-4-2 for the measurement methods.

The EUT (Repeater) can function as both transmitter and receiver, so the evaluation of the TRptr to ESD has undergone by the following means:

Trptr:

An unmodulated RF signal shall be input to an RF connector which is the input to an amplifier within the EUT. The frequency shall be within the operating band of the EUT. The signal shall be monitored at an RF connector which is an output from the amplifier under test. The level of the RF signal shall be increased until the level at the output RFconnector equals the manufacturers declared maximum RF output power for a single RF carrier.

The gain of the RF amplifier is the ratio, expressed in dB of the output power to the input power.

The gain shall be measured before the test, and after each exposure.

This test shall be performed for each RF connector which is the input to an RF amplifier. In each case, the gain of the amplifier shall be determined by measurement at an antenna connector which is one representative output from the amplifier. This may be achieved by performing one test for which the gain of all the amplifiers in the EUT is measured, or by repeating the test for each amplifier to be tested.

TEST RESULTS

Description of the Electrostatic Discharges (ESD)

☒ Operation(DCS 1800)

Amount of Discharges	Voltage	Coupling	Measured Gain	Result (Pass/Fail)
Mini 20 / Point	±2KV, ±4kV	Contact Discharge	See Note	Pass
Mini 20 / Point	±2KV, ±4kV, ±8kV	Air Discharge	N/A	Pass
Mini 20 / Point	±2KV, ±4kV	Indirect Discharge HCP	See Note	Pass
Mini 20 / Point	±2KV, ±4kV	Indirect Discharge VCP	See Note	Pass

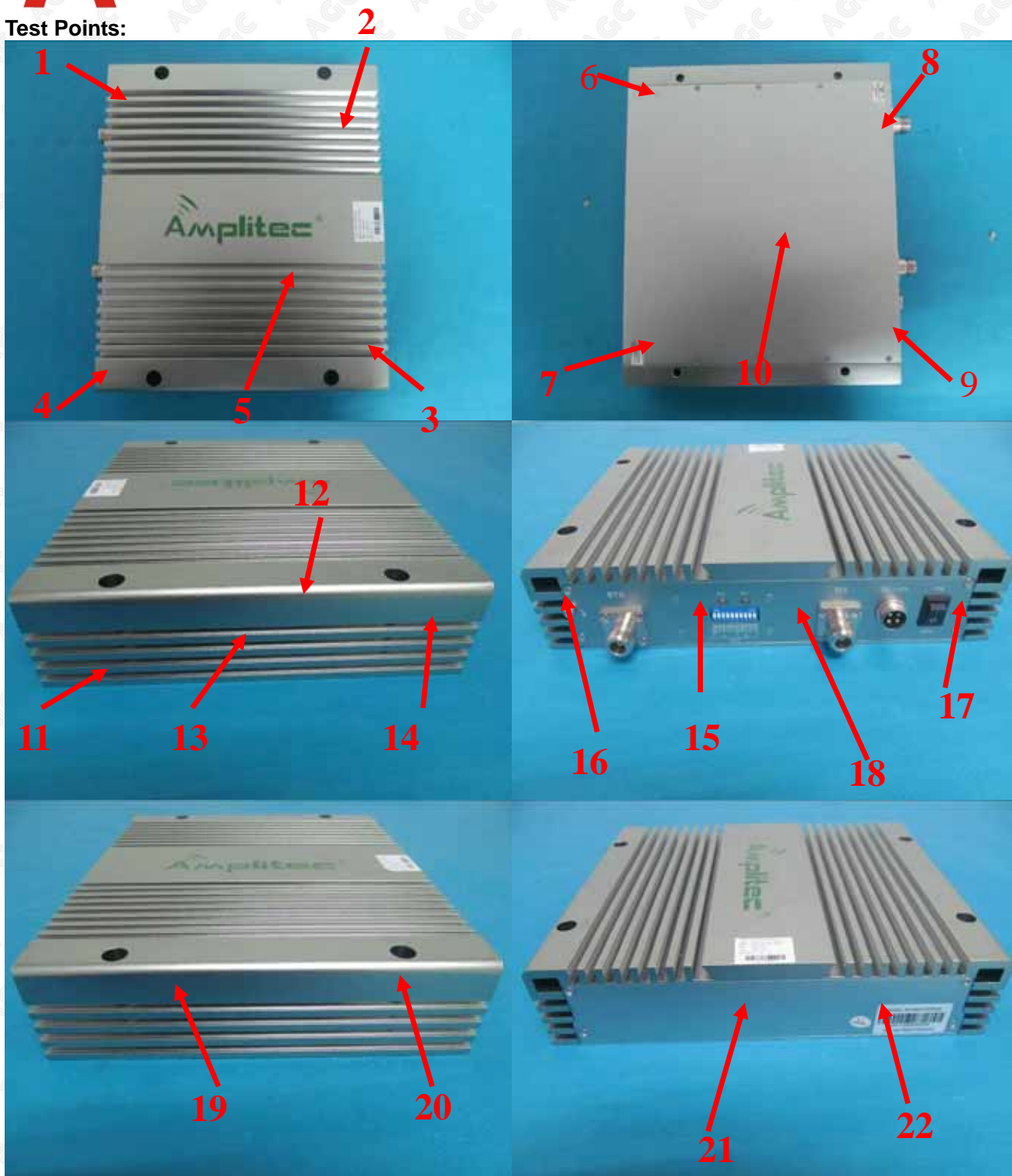
Note: Before the test and after the test, the change of gain of an amplifier range is not more than ±1dB, which is compliant TRptr.

PERFORMANCE CRITERIA

Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C

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Test Points:



From point 1 to 22 were contact discharge. No air discharge.

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7.5. RF ELECTROMAGNETIC FIELD

LIMIT

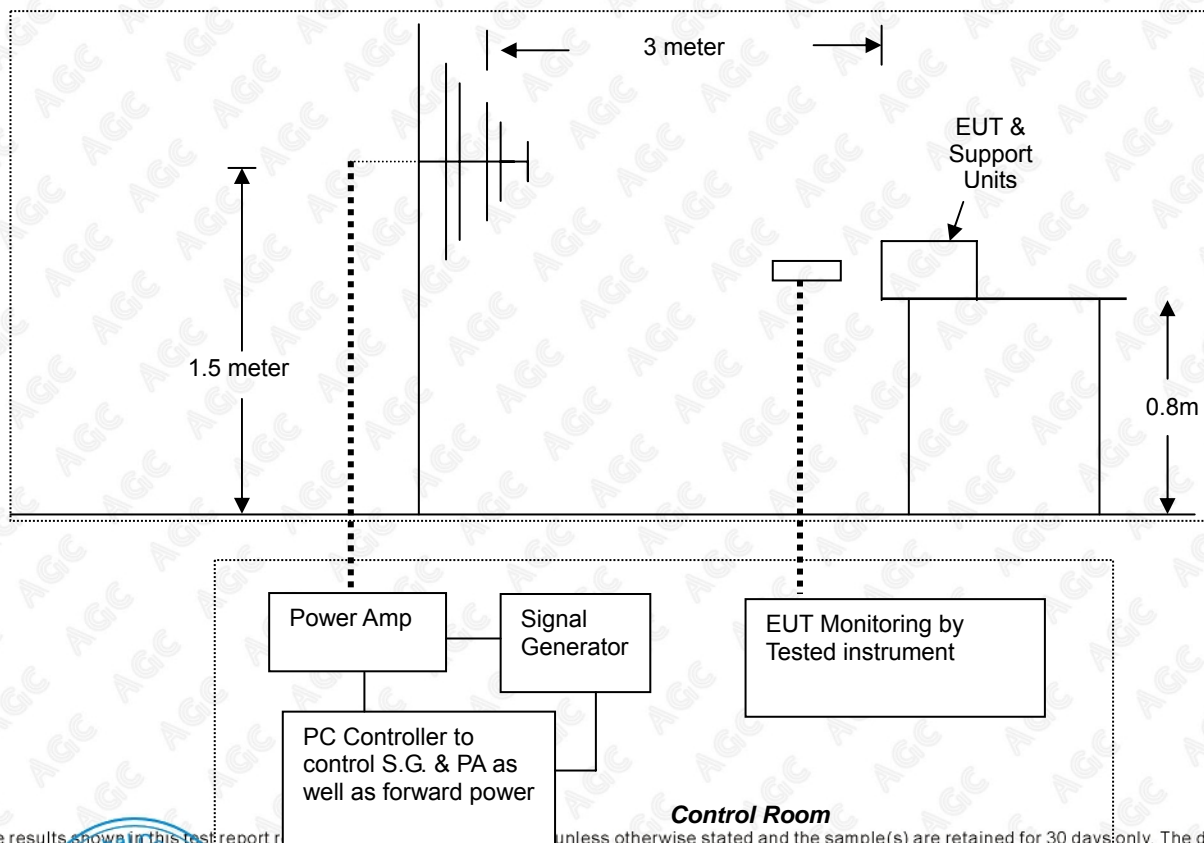
Please refer to EN 61000-4-3

MEASUREMENT EQUIPMENT USED

Radiated Electromagnetic Field immunity Measurement (61000-4-3)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Signal Generator	IFR	2031	73535	2014-07-16
Power Amplifier	AR	150W1000	322276	2014-07-16
Power Amplifier	AR	25S1G4A	321119	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16
Spectrum Analyzer	R&S	FSU	--	2014-07-16
Antenna	A.H.	SAS-521-4	N/A	2014-07-16
Antenna	EM	EM-AH-10180	N/A	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



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Ambient Condition of the Test Site			
Temperature	22°C	EUT AC Voltage Rating	AC 230V
Humidity	50%RH	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Curoky		

TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.2.2, ETSI EN 301 489-5 Clause 7.2.2 and EN 61000-4-3 for the measurement methods.

The EUT (Repeater) can function as both transmitter and receiver, so the evaluation of the CRptr to RF immunity field has undergone by the following means:

CRptr:

An unmodulated RF signal shall be input to an RF connector which is the input to an amplifier within the EUT. The frequency shall be within the operating band of the EUT. The signal shall be monitored at an RF connector which is an output from the amplifier under test. The level of the RF signal shall be increased until the level at the output RF connector equals the manufacturers declared maximum RF output power for a single RF carrier.

The gain of the RF amplifier is the ratio, expressed in dB of the output power to the input power.

The gain shall be measured throughout the period of exposure to the phenomenon.

This test shall be performed for each RF connector which is the input to an RF amplifier. In each case, the gain of the amplifier shall be determined by measurement at an antenna connector which is one representative output from the amplifier. This may be achieved by performing one test for which the gain of all the amplifiers in the EUT is measured, or by repeating the test for each amplifier to be tested.

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TEST RESULTS

Description of Preliminary Test (Operation(DCS 1800))

	Freq. Range (MHz)	Field	Modulation	Polarity	Position (°)	Selection for the final test
1	80-1000	6V/m	Yes	H / V	Front	<input checked="" type="checkbox"/>
	1400-2700	6V/m	Yes	H / V	Front	<input checked="" type="checkbox"/>
2	80-1000	6V/m	Yes	H / V	Right	
	1400-2700	6V/m	Yes	H / V	Right	
3	80-1000	6V/m	Yes	H / V	Back	
	1400-2700	6V/m	Yes	H / V	Back	
4	80-1000	6V/m	Yes	H / V	Left	
	1400-2700	6V/m	Yes	H / V	Left	

☒ Result of Final Tests (Operation(DCS 1800) and standby Mode)

Freq. Range (MHz)	Field	Modulation	Polarity	Position	Measured Gain	Result (Pass/Fail)
1400-2700	3V/m	Yes	H / V	Front	See Note	Pass
80-1000	3V/m	Yes	H / V	Front	See Note	Pass
1400-2700	3V/m	Yes	H / V	Front	See Note	Pass
80-1000	3V/m	Yes	H / V	Front	See Note	Pass

Note: Before the test, during the test and after the test, the change of gain of an amplifier range is not more than $\pm 1\text{dB}$, which is compliant CRptr.

PERFORMANCE CRITERIA	
Criteria requested	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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7.6. AC MAINS FAST TRANSIENTS – COMMON MODE

LIMIT

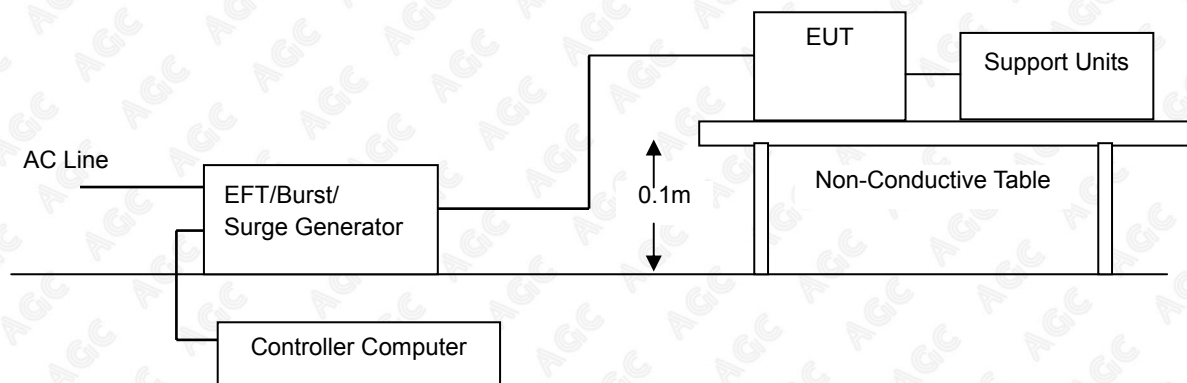
Please refer to EN 61000-4-4

MEASUREMENT EQUIPMENT USED

AC MAINS FAST TRANSIENTS - COMMON MODE (EN 61000-4-4)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Electrical Fast Transient Burst Generator	LIONCEL	EFT-404B	EFT04401011	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16
Spectrum Analyzer	R&S	FSU	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST CONFIGURATION



Ambient Condition of the Test Site			
Temperature	24°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	51%RH	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Curoky		

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TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.4.3 and EN 61000-4-4 for the measurement methods.

For TRptr, refer to sub-clause 7.5..

TEST RESULTS

☒ Results of Final Tests (Operation (DCS 1800) and Standby Mode)

Impulse Frequency: 5 kHz

Tr/Th: 5/50ns

Burst Duration: 15ms

Burst Period: 3Hz

Injection Line	Voltage (kV)	Injected Method	Measured Gain	Result (Pass / Fail)
<input checked="" type="checkbox"/> Line	±1	Direct	See Note	Pass
<input checked="" type="checkbox"/> Neutral	±1	Direct	See Note	Pass
<input checked="" type="checkbox"/> Line+ Neutral	±1	Direct	See Note	Pass

Note: Before the test and after the test, the change of gain of an amplifier range is not more than ±1dB, which is compliant TRptr.

PERFORMANCE CRITERIA	
Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C

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7.7. AC MAINS SURGE

LIMIT

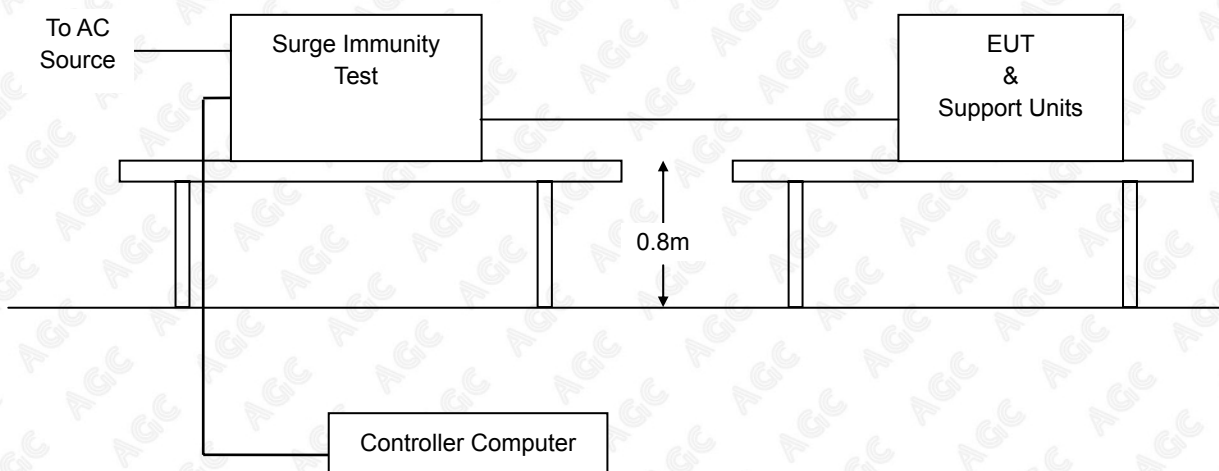
Please refer to EN 61000-4-5

MEASUREMENT EQUIPMENT USED

AC MAINS SURGES (EN 61000-4-5)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Lightning Surge Generator	LIONCEL	LSG-506A	LSG056001010	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16
Spectrum Analyzer	R&S	FSU	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



Ambient Condition of the Test Site			
Temperature	24°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	51%RH	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Mary		

TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.8.2 and EN 61000-4-5 for the measurement methods.

For TRprtr, refer to sub-clause 7.5.

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TEST RESULTS

☒ Results of Final Tests (Operation(DCS 1800) and Standby Mode)

Voltage Waveform: 1.2/50 us

Current Waveform: 8/20 us

Polarity: Positive/Negative

Phase angle: 0°, 90°, 180°, 270°

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Measured Gain	Result (Pass/Fail)
<input checked="" type="checkbox"/> Line + Neutral	1	Pos./ Neg.	Capacitive	See Note	Pass

Note: Note: Before the test and after the test, the change of gain of an amplifier range is not more than $\pm 1\text{dB}$, which is compliant TRptr.

PERFORMANCE CRITERIA

Criteria requested	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input type="checkbox"/> A / <input checked="" type="checkbox"/> B / <input type="checkbox"/> C

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7.8. AC MAINS RF – COMMON MODE

LIMIT

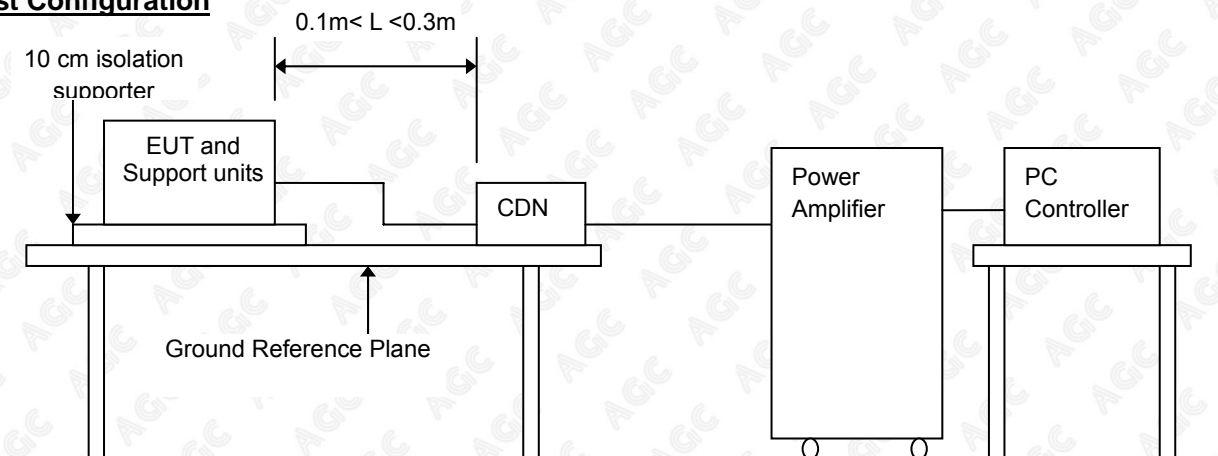
Please refer to EN 61000-4-6

MEASUREMENT EQUIPMENT USED

AC MAINS RF COMMON MODE (EN 61000-4-6)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SIGNAL GENERATOR	IFA	2023B	202301/878	2014-07-16
AMPLIFIER	AR	75A250A	302276	2014-07-16
DUAL DIRECTIONAL COUPLER	AR	DC2600A	302389	2014-07-16
CDN	EM TEST	CDN M1/32A	0201-01	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16
Spectrum Analyzer	R&S	FSU	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



Ambient Condition of the Test Site			
Temperature	25°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	52%RH	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	mary		

TEST PROCEDURE

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Please refer to ETSI EN 301 489-1 Clause 9.5.2 and EN 61000-4-6 for the measurement methods
For CRptr, refer to sub-clause 7.6.

TEST RESULTS

☒ **Results of Final Tests (Operation (DCS 1800) and Standby Mode)**

Frequency Range: 0.15MHz~80MHz
Frequency Step: 1% of fundamental
Dwell time: 3 Sec.

- ☒ **80% A.M., 1000 Hz Sine wave (Voltage: 3 V)**
☒ **Coupling type:** ☒ **CDN** / ☐ **RF Current Probe**

Range (MHz)	Voltage	Modulation	Measured Gain	Result (Pass/Fail)
0.15-80	3V	Yes	See Note	Pass

Note: Before the test, during the test and after the test, the change of gain of an amplifier range is not more than ± 1 dB, which is compliant CRptr.

PERFORMANCE CRITERIA	
Criteria requested	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C
Criteria meet	<input checked="" type="checkbox"/> A / <input type="checkbox"/> B / <input type="checkbox"/> C

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7.9. VOLTAGE DIPS AND INTERRUPTION

LIMIT

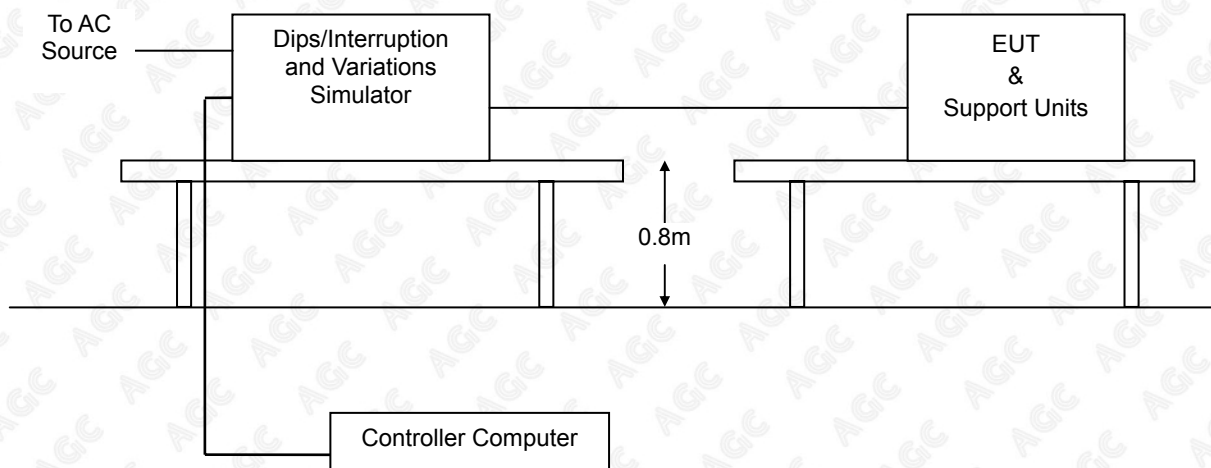
Please refer to EN 61000-4-11

MEASUREMENT EQUIPMENT USED

VOLTAGE DIPS AND INTERRUPTIONS (EN 61000-4-11)				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Cycle Voltage Dip Simulator	LIONCEL	VDS-1120D	VDS11200901	2014-07-16
Wireless Communications Test Set	Agilent	8960	--	2014-07-16
Spectrum Analyzer	R&S	FSU	--	2014-07-16

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



Ambient Condition of the Test Site			
Temperature	24°C	EUT AC Voltage Rating	AC 230V/50Hz
Humidity	51%RH	EUT DC Voltage Rating	N/A
Pressure	990 mbar	Ground Bond Resistance	0.2 Ω
Tested by	Curoky		

TEST PROCEDURE

Please refer to ETSI EN 301 489-1 Clause 9.7.2 and EN 61000-4-11 for the measurement methods. For TRprtr, refer to sub-clause 7.5.

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TEST RESULTS

Test conditions

Interruption at phase angles of 0, 45, 90, 135, 180, 225, 270 and 315 degree in a 10 sec-interval.

Dips / Interruption	Reduction (%)	Duration (ms)
Voltage Dips	30%	500
Voltage Dips	60%	100
Voltage Dips	100%	10
Voltage Dips	100%	20
Voltage Interruption	100%	5000

Note: The duration with a sequence of three dips/interruptions with a minimum interval of 10 s between each test event.

☒ Results of Final Tests (Operation(DCS 1800) and Standby Mode)

☒ Voltage Dips

Test Level (% UT)	Reduction (%)	Duration (ms)	Measured Gain	Criterion request	Criterion meet
70	30	500	See Note	C	B

Note: The supply voltage is restored to its nominal value as soon less than 1 minute, and measured gain change range is not more than ± 1 dB, which is compliant TRptr.

☒ Voltage Dips

Test Level (% UT)	Reduction (%)	Duration (ms)	Measured Gain	Criterion request	Criterion meet
40	60	100	See Note	C	B

Note: The supply voltage is restored to its nominal value as soon less than 1 minute, and measured gain change range is not more than ± 1 dB, which is compliant TRptr

☒ Voltage Dips

Test Level (% UT)	Reduction (%)	Duration (ms)	Measured Gain	Criterion request	Criterion meet
0	100	10	See Note	B	B

Note: The supply voltage is restored to its nominal value as soon less than 1 minute, and measured gain change range is not more than ± 1 dB, which is compliant TRptr.

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☒ Voltage Dips

Test Level (% UT)	Reduction (%)	Duration (ms)	Measured Gain	Criterion request	Criterion meet
0	100	20	See Note	B	B

Note: The supply voltage is restored to its nominal value as soon less than 1 minute, and measured gain change range is not more than $\pm 1\text{dB}$, which is compliant *TRptr*.

☒ Voltage Interruption

Test Level (% UT)	Reduction (%)	Duration (ms)	Measured Gain	Criterion request	Criterion meet
0	100	5000	See Note	B	B

Note: The supply voltage is restored to its nominal value as soon less than 1 minute, and measured gain change range is not more than $\pm 1\text{dB}$, which is compliant *TRptr*.

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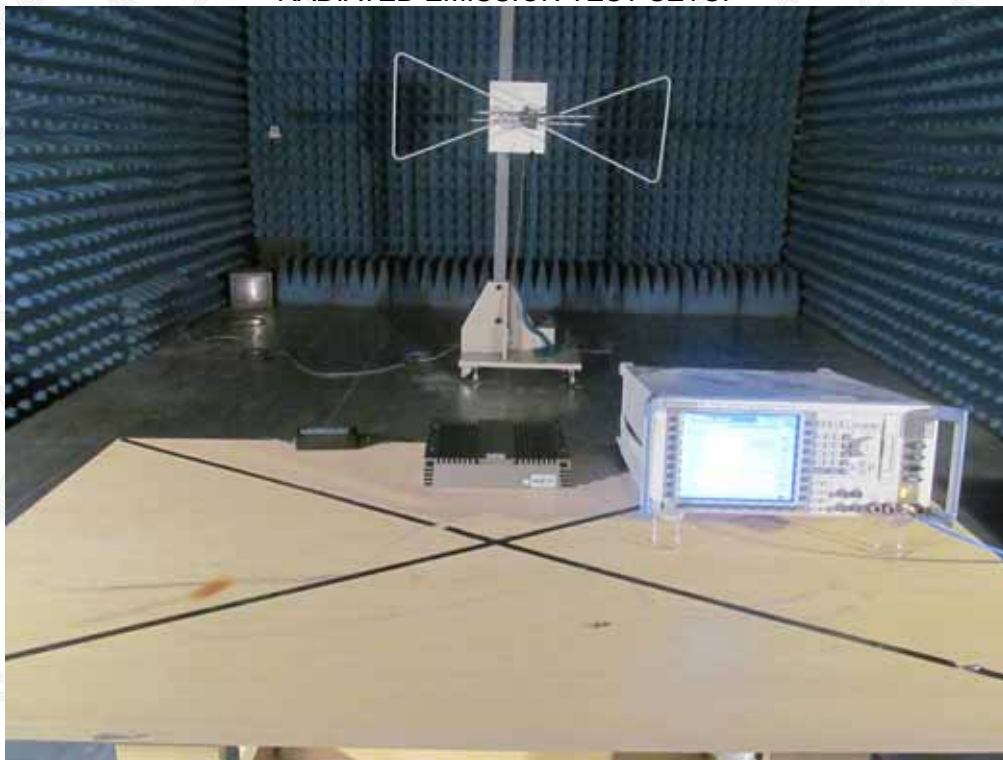
APPENDIX 1

PHOTOGRPHS OF TEST SETUP

CONDUCTED EMISSION TEST SETUP

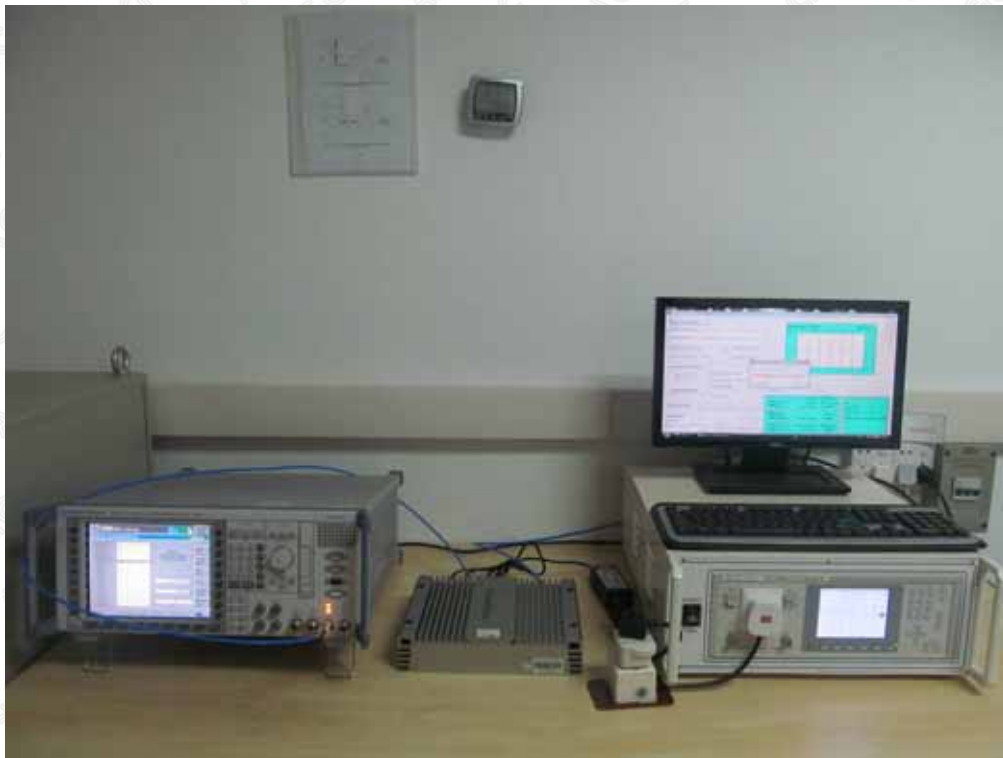


RADIATED EMISSION TEST SETUP



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HARMONIC AND FLICKER TEST SETUP



ELECTROSTATIC DISCHARGE TEST SETUP



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EFT TEST SETUP



SURGE TEST SETUP



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CS TEST SETUP



DIPS TEST SETUP



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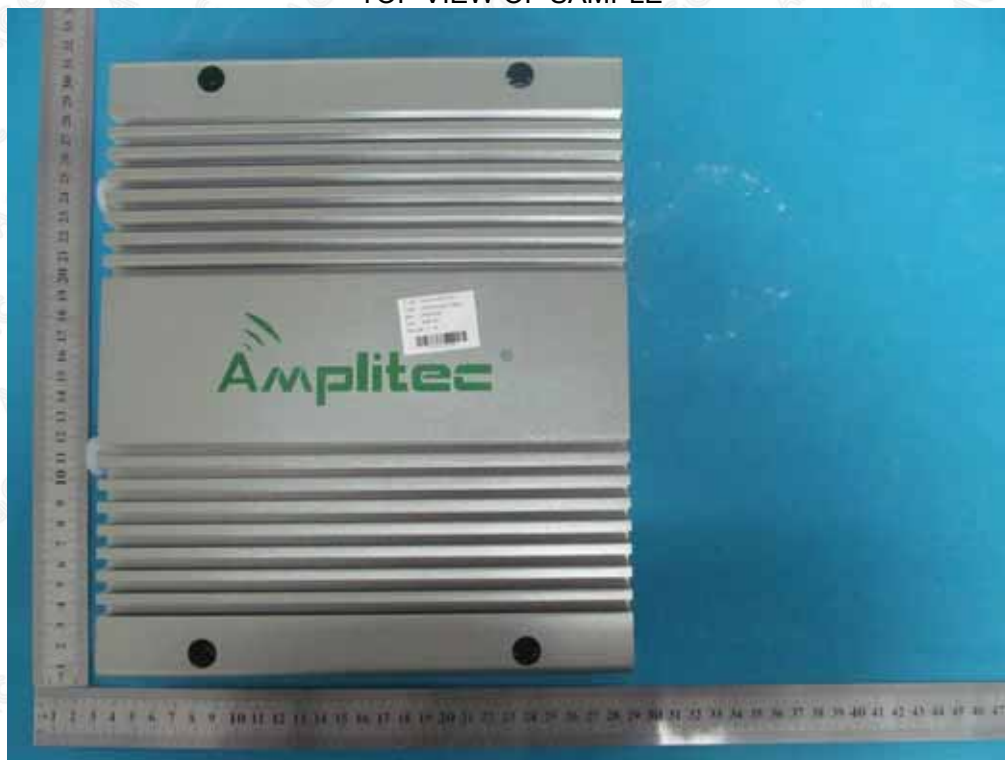
APPENDIX 2

PHOTOGRPHS OF EUT

All VIEW OF SAMPLE

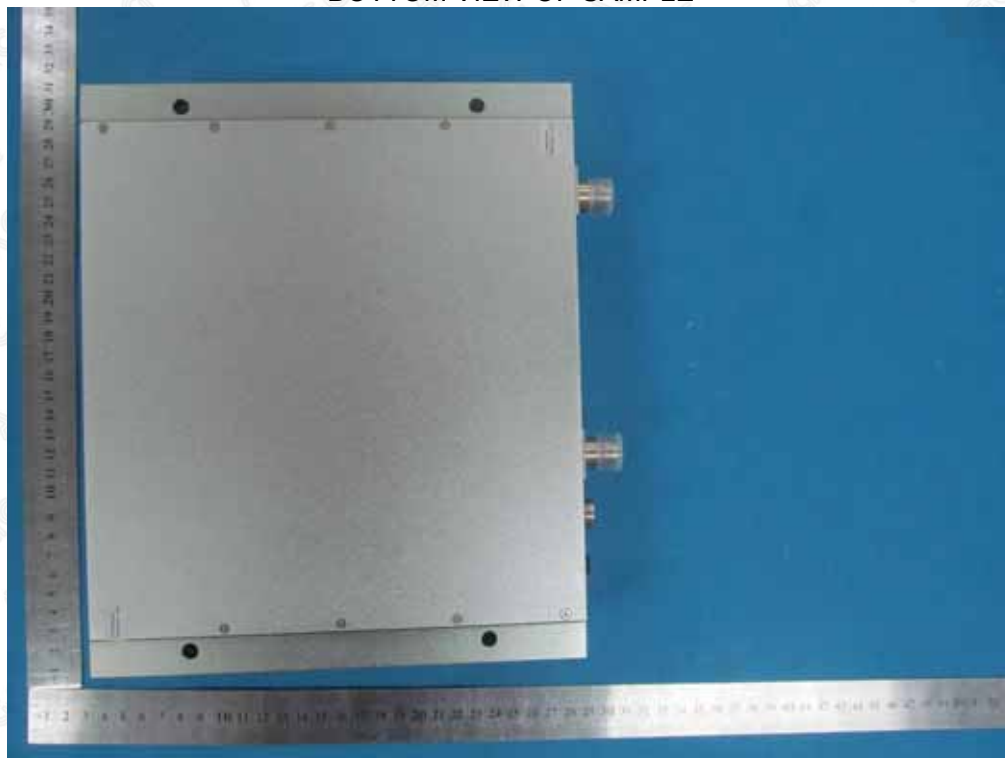


TOP VIEW OF SAMPLE



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BOTTOM VIEW OF SAMPLE



FRONT VIEW OF SAMPLE



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BACK VIEW OF SAMPLE



LEFT VIEW OF SAMPLE

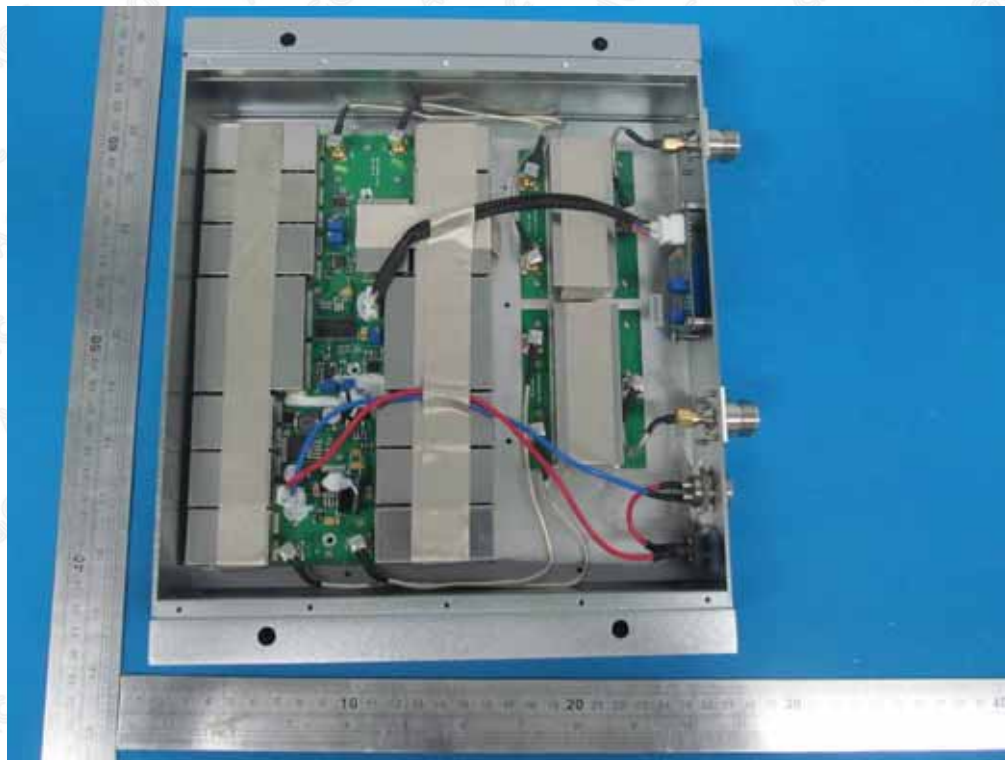


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RIGHT VIEW OF SAMPLE

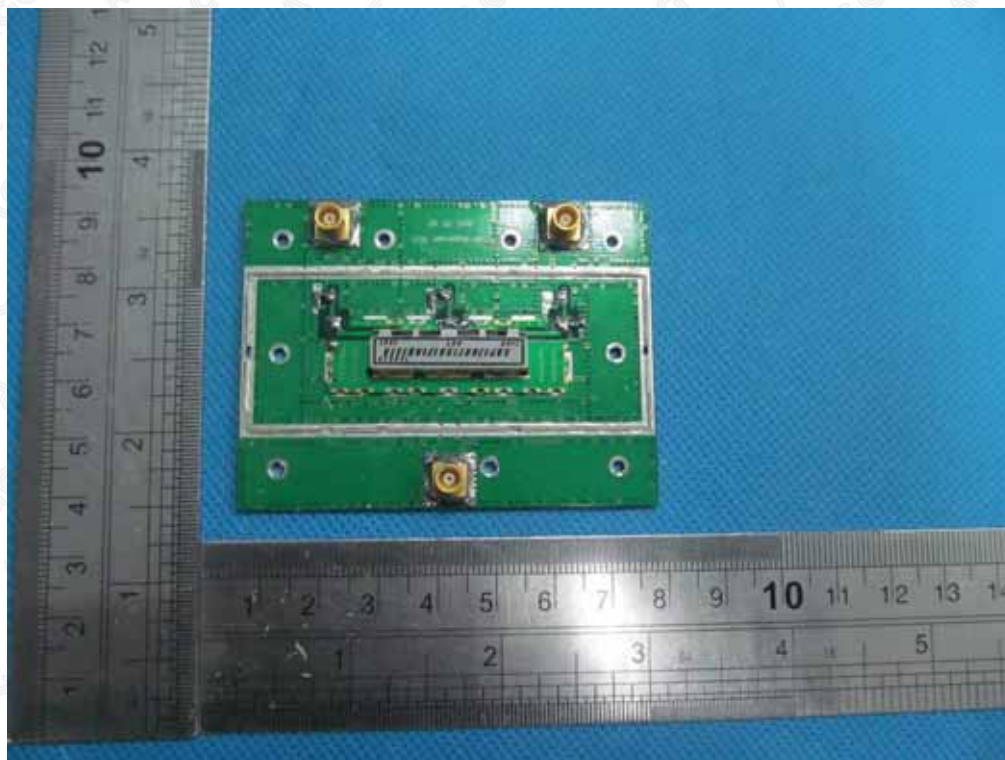


OPEN VIEW OF SAMPLE

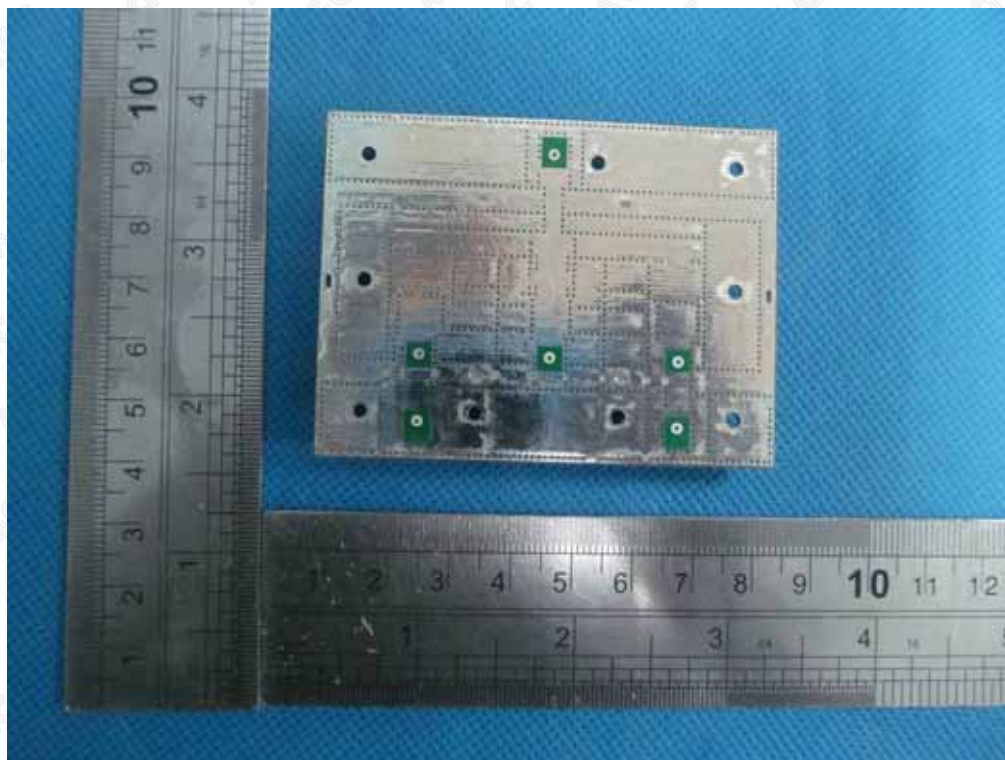


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INTERNAL VIEW OF SAMPLE-1

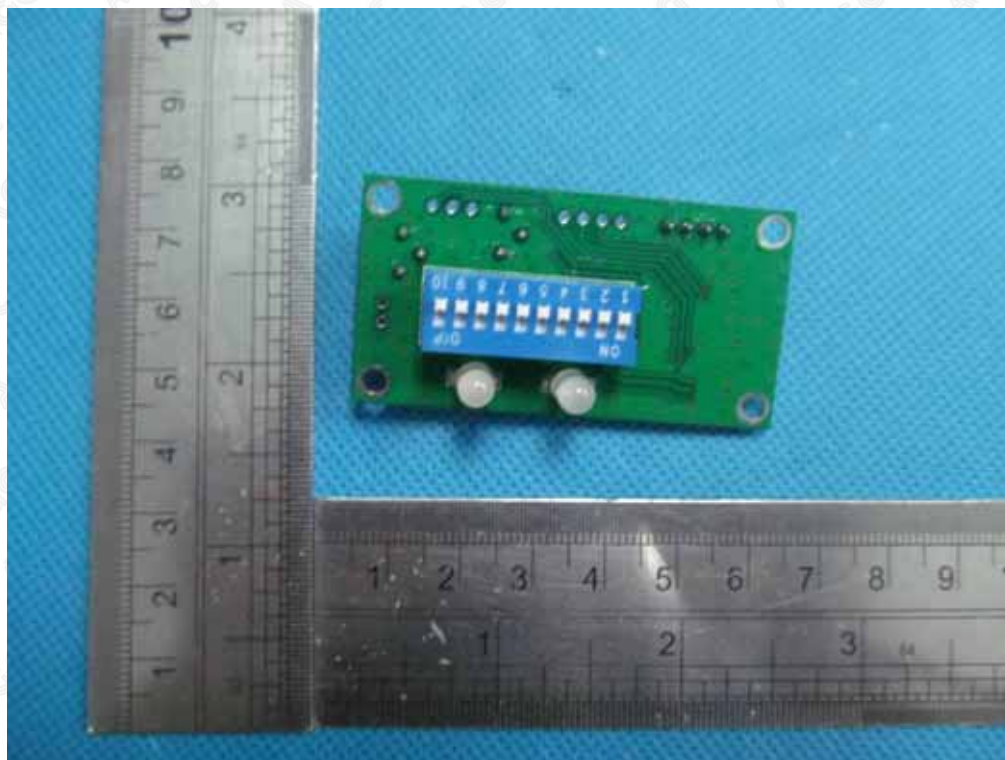


INTERNAL VIEW OF SAMPLE-2



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INTERNAL VIEW OF SAMPLE-3



INTERNAL VIEW OF SAMPLE-4

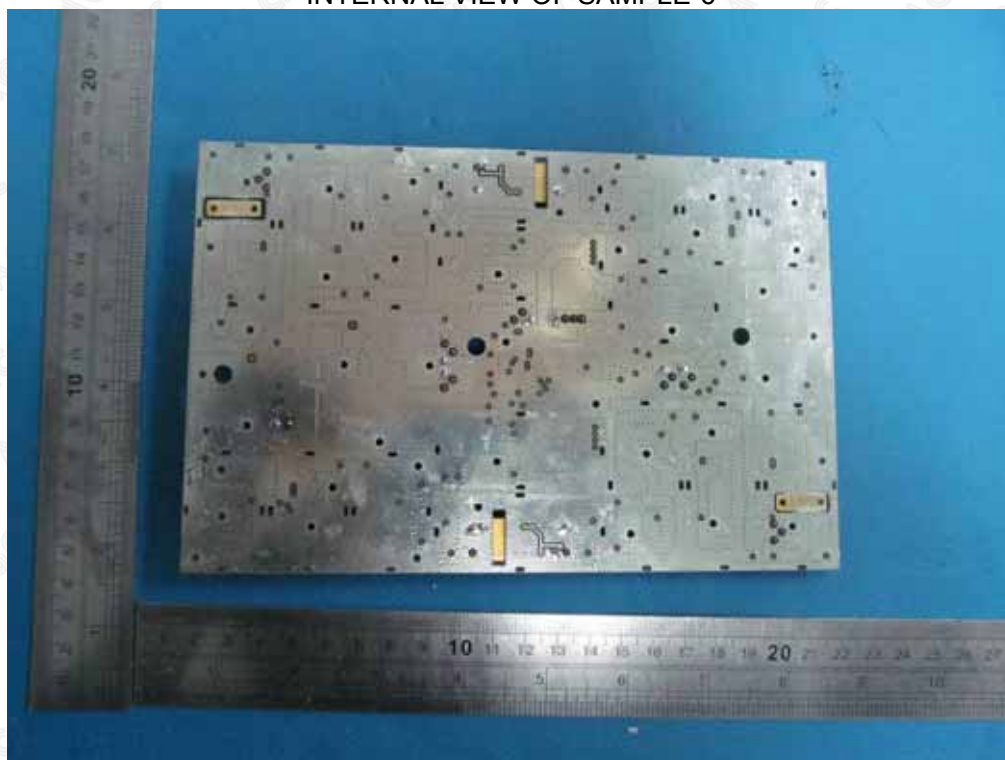


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INTERNAL VIEW OF SAMPLE-5



INTERNAL VIEW OF SAMPLE-6



---END OF REPORT---

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